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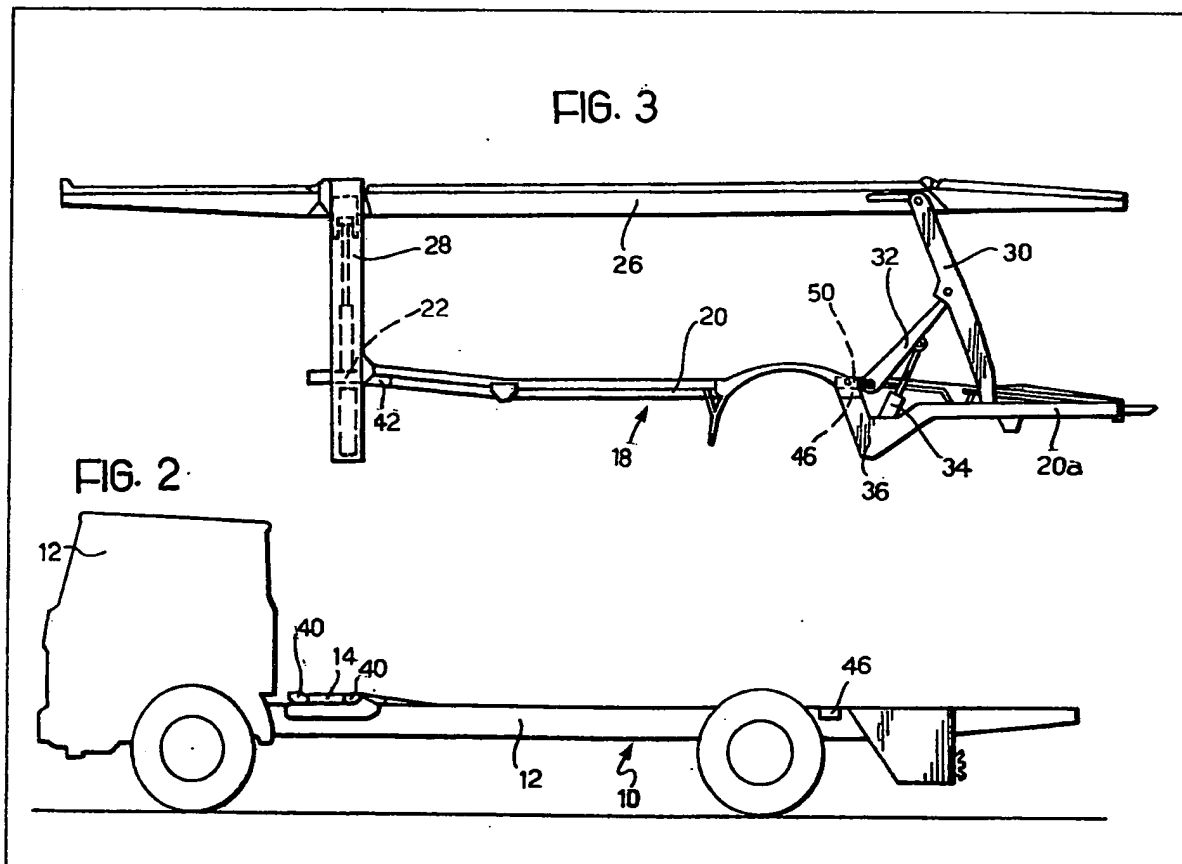
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(54) Road vehicle with a removable  
 load-carrying superstructure

(57) A road vehicle comprises a chas-

sis constituted by a pair of longitudinally extending girders (12) interconnected by cross beams, and a load-carrying superstructure fixed to the chassis. The load-carrying superstructure in turn comprises a base framework (18) separate from the vehicle chassis (10) and formed by a pair of longitudinally extending girders (20) interconnected by cross beams. The girders (12) of the vehicle chassis (10) are provided with lateral support brackets (40, 46) at least in the region of the front and the rear parts of the chassis itself. The framework (18) of the load-carrying superstructure includes cross members which are located in correspondence with the support brackets (40, 46) and are provided with blocks (42, 50) bearing on the support brackets themselves. Each support bracket (40, 46) and each bearing block (42, 50) has quick-release inter-connection means for enabling the load-carrying superstructure to be readily removed and replaced.



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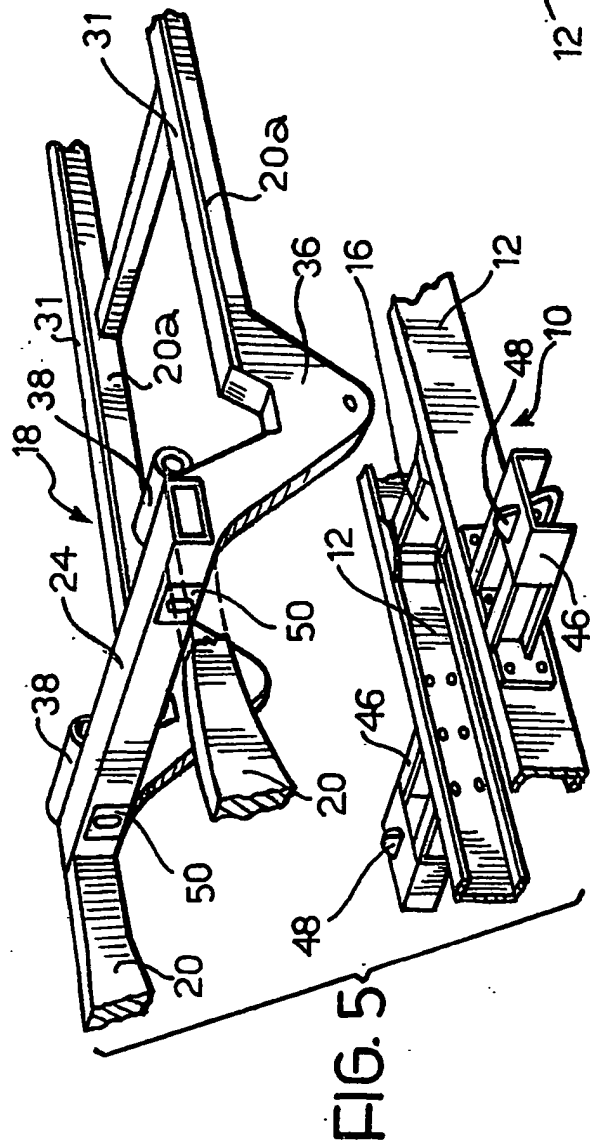
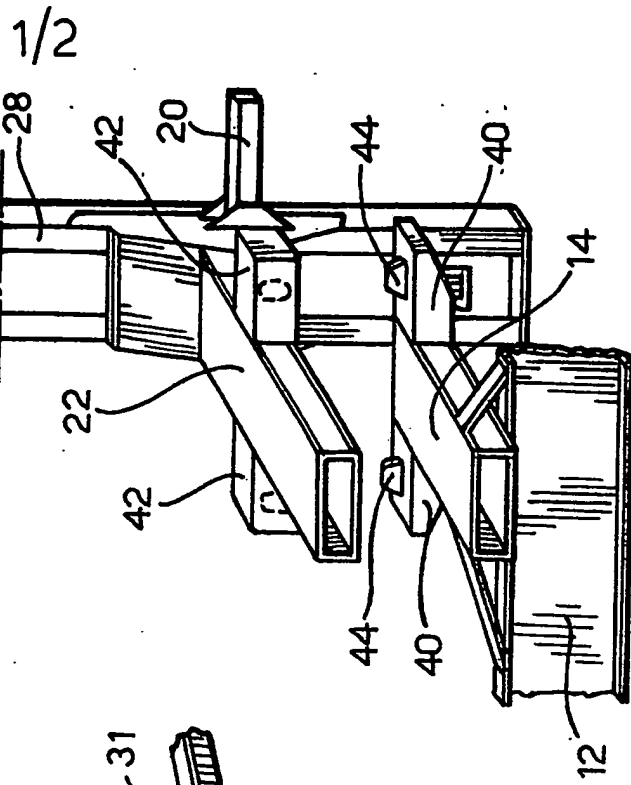
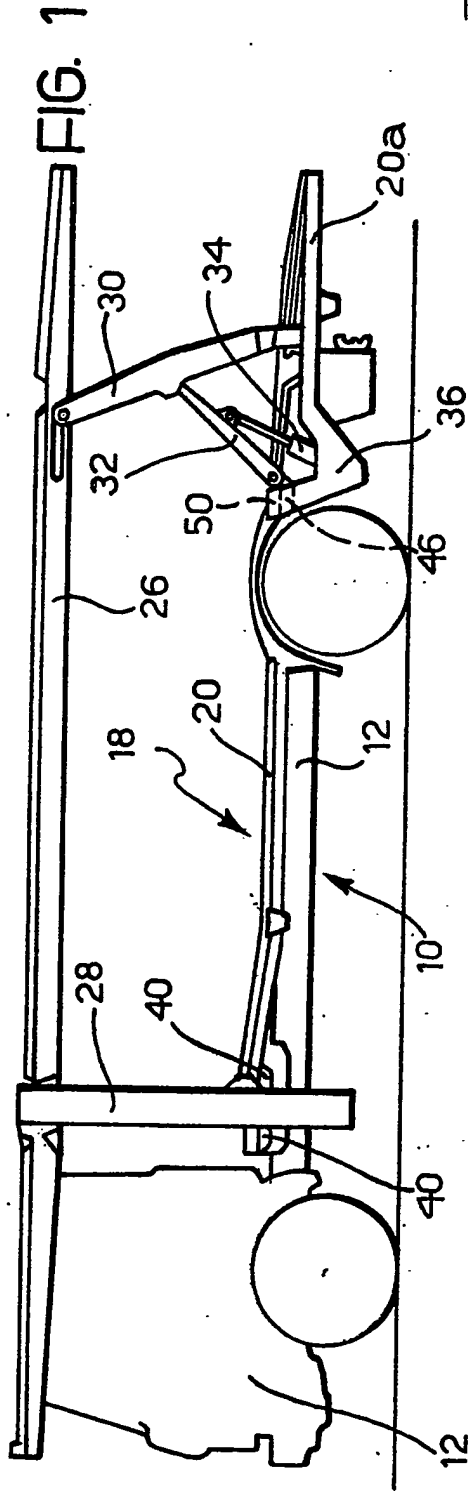


FIG. 3

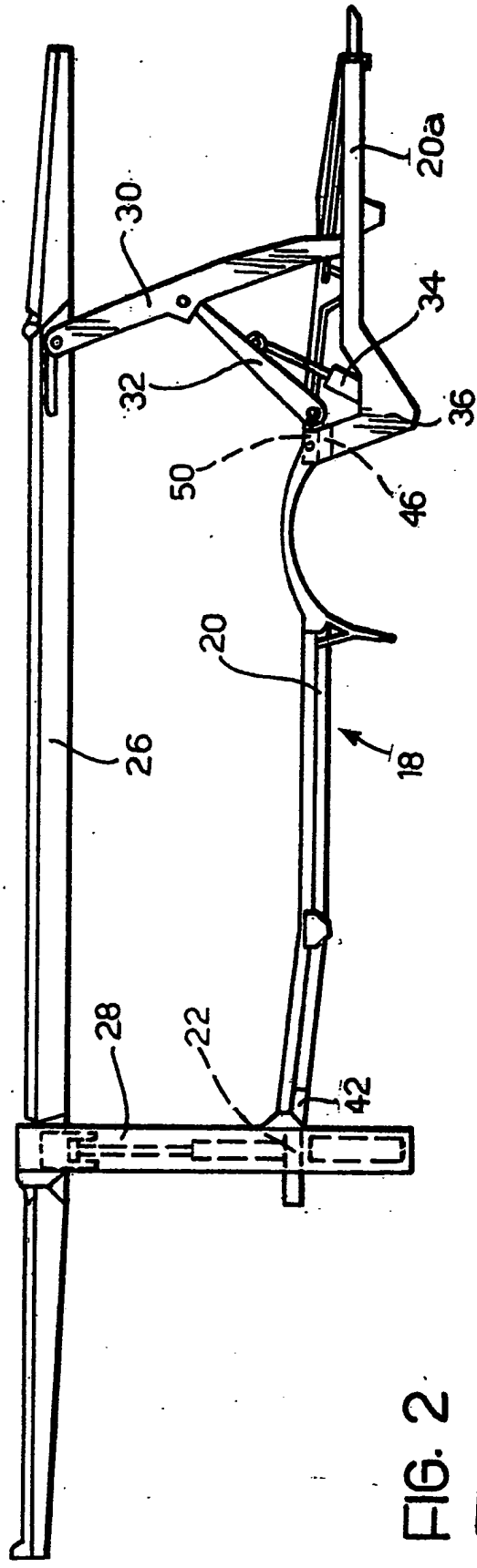
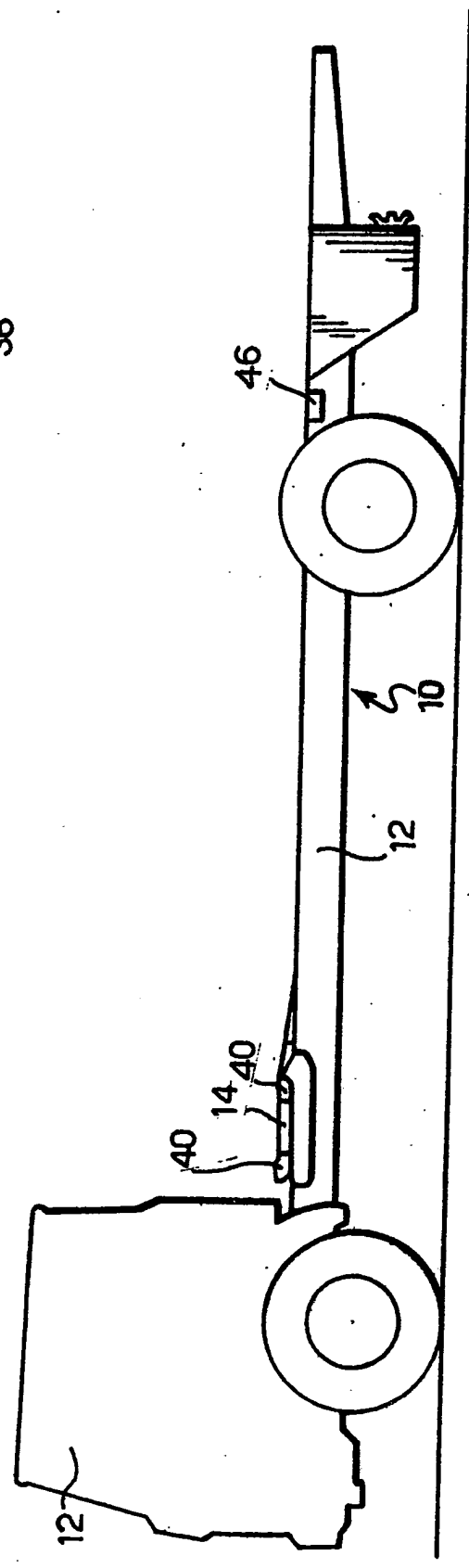


FIG. 2



## SPECIFICATION

**Road vehicle with a removable load-carrying superstructure**

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The present invention relates to a road vehicle of the type comprising a chassis including a pair of longitudinally extending girders interconnected by cross members, and a load-carrying superstructure fixed to the chassis.

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In many cases a road vehicle, such as a lorry, trailer or semi-trailer adapted for specialised transport such as, for example, the transporting of motor vehicles, is not fully employed for the task for which it is normally adapted and it would be desirable to be able to use it for other types of transport.

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The object of the invention is to provide a vehicle with a load-carrying superstructure that can be interchanged with other structures suitably designed for other purposes, examples of such structures being a platform, a box body, a sheet-carrying superstructure, and a boat carrying superstructure.

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According to the present invention this object is achieved by means of a road vehicle of the aforementioned type wherein the load-carrying superstructure comprises a base framework that is separate from the vehicle chassis and is formed by a pair of longitudinally extending girders interconnected by cross members, the longitudinal girders of the vehicle chassis being provided with lateral support brackets at least in the region of the front and rear parts of the chassis itself, and the framework of the load-carrying superstructure including cross members which are located in correspondence with said support brackets and are provided with blocks bearing on the brackets themselves, each support bracket and corresponding bearing block having quick-release inter-connection means for enabling the load carrying superstructure to be readily removed from, and replaced on, the vehicle chassis.

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The object of the invention will be better understood from the detailed description which follows, made with reference to the appended drawings, given purely by way of non-limiting example, in which:

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*Figure 1* is a side elevation of a lorry having a removable superstructure in the form of a vehicle-carrying superstructure,

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*Figures 2 and 3* are elevations similar to that of *Figure 1* but to a larger scale, showing separately the lorry and the vehicle-carrying superstructure, and

*Figures 4 and 5* are broken away perspective views of cooperating inter-connectible parts of the motor-vehicle chassis and of the removable load-carrying structure attachable to the chassis.

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Referring to *Figures 1* to *3*, a lorry or a trailer-truck tractor for transporting motor vehicles includes a chassis generally indicated *10*. The front part of the chassis *10* carries a cab *12*.

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The chassis *10* (see also *Figures 4* and *5*) includes a pair of longitudinally extending girders *12* interconnected by a front cross member *14* and a rear cross member *16*. Attached to the chassis *10* is a load-carrying superstructure which, in the example shown, is in the form of a vehicle-carrying super-

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structure of the type having two superimposed platforms.

The superstructure, which is shown in its entirety in *Figures 1* and *3*, in turn includes a base framework *18* distinct from the chassis *10* of the vehicle. The framework *18* is also basically constituted by a pair of longitudinal girders *20* interconnected by cross members, including a front cross member *22* and a rear cross member *24*.

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The base framework *18* of the superstructure is provided with tracks (not shown) for the wheels of the motor vehicles (normally motor cars) to be transported to run on, and thus constitutes a lower transport platform.

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From its base framework *18*, the removable superstructure supports an upper platform which is also designed to transport vehicles, this platform and, in particular, its longitudinal girders, being indicated by reference numeral *26*.

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The upper platform *26* is supported from the base framework or lower platform *18* by means of a pair of front pillars *28* and a pair of rear pillars *30*.

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The front part of the upper platform *26* is movable vertically up and down the pillars *28* between the raised position of *Figures 1* and *3* and a lowered position in which it lies on the lower platform or base framework *18*; in addition it can also be inclined rearwardly. The rear pillars *30* are articulated to the longitudinal girders of the upper framework while at their lower ends they are articulated to rear projections *20a* of the longitudinal girders *20* by means of sliders slidable in guides *31* which form part of the projections *20a*.

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The rear pillars *30* form part of elevation means which also include a pair of pivoting supports *32*. Each rear pillar *30* is articulated at an intermediate point of its extent, about a transverse horizontal axis, to one end of a respective support *32*. The two pivoting supports *32* are keyed to a single common transverse shaft such that they lie parallel to each other and constitute a rigid fork. Means for pivoting the fork are provided comprising a pair of hydraulic jacks *34* the upper ends of which are articulated to the supports *32* and the lower ends of which are articulated to the downwardly-directed vertices of substantially V-shaped recessed parts *36* of the longitudinal girders *20* of the removable superstructure. The recessed parts *36* are behind the rear wheels of the lorry.

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The shaft of the fork whose arms are constituted by the supports *32*, is rotatably supported by bushes or sleeves *38* fixed to the rear cross member *24* of the superstructure framework *18*.

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Advantageously, the fixing and mounting of the vehicle-carrying superstructure (or other load-carrying structure) on the vehicle chassis *10* is as follows.

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The front cross member *14* of the vehicle chassis *10* has, on each side, a pair of support brackets *40* best seen in *Figure 4*. In correspondence with the support brackets *40*, the front cross member *22* of the superstructure framework *18* has corresponding support blocks *42*.

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The support blocks *42* are preferably of the 'ISO' standard hollow type with a lower aperture. The

support brackets 40 carry connection means of the so-called twist-lock rotatable key type 44, the key 44 of which is engageable in the block 42 through its lower aperture.

- 5 In correspondence with the rear cross member 24 of the superstructure framework 18, the longitudinal girders 12 of the vehicle chassis 10 carry a pair of lateral support brackets 46. Each of these support brackets 46 has connection means of the said
- 10 twist-lock type, the key of which is indicated 48.

Correspondingly, the cross member 24 of the superstructure framework 18 incorporates support blocks of the said 'ISO' standard type, indicated 50.

- 15 The blocks 50 allow the rear part of the superstructure to be fixed to the vehicle chassis 10 by means of the rear twist-lock type connection means.

A load-carrying superstructure such as that illustrated in particular in Figure 3, although distinct from the vehicle chassis 10, is independently rigid due to the presence of the longitudinal girders 20 which may be box girders or constituted by profiled sections, and which are interconnected by cross members. The superstructure may thus be removed from the transport vehicle without undergoing any

25 harmful deformations.

- During transport, the rigidity of the chassis 10 of the vehicle contributes to the rigidity of the superstructure. Moreover, the points of the superstructure which are under most stress are located in correspondence with the front pillars 28 and the rear pillars 30 and are firmly although releasably attached to the chassis 10 of the vehicle by the twist lock systems. Thus, the keying shaft of the rigid fork constituted by the supports 32 is itself situated in the zone in which
- 30 the rear part of the superstructure is attached to the vehicle chassis 10, that is, on the cross member 24 which is firmly fixed to the support brackets 42.

#### CLAIMS

- 40 1. A road vehicle of the type comprising a chassis including a pair of longitudinally extending girders interconnected by cross members, and a load-carrying superstructure fixed to the chassis, the
- 45 load-carrying superstructure comprising a base framework that is separate from the vehicle chassis and is formed by a pair of longitudinally extending girders interconnected by cross members, the longitudinal girders of the vehicle chassis being provided
- 50 with lateral support brackets at least in the region of the front and rear parts of the chassis itself, and the framework of the load-carrying superstructure including cross members which are located in correspondence with said support brackets and are provided with blocks bearing on the brackets, each
- 55 support bracket and the corresponding bearing block having quick-release inter-connection means enabling the load-carrying superstructure to be readily removed from and replaced on the vehicle
- 60 chassis.

2. A vehicle according to Claim 1, wherein each support block is of the 'ISO' standard hollow type with a lower aperture, and each inter-connection means is of the twist-lock type having a key which is
- 65 engageable in the corresponding block through the

lower aperture of the block itself.

3. A vehicle according to Claim 1 or Claim 2, wherein the removable load-carrying superstructure is a vehicle-carrying structure with two superimposed platforms, the upper one of which can be inclined and lowered by means of respective front and rear elevation means, said elevation means being located in correspondence with those cross members of the superstructure that are provided
- 70 with the support blocks.

4. A vehicle according to Claim 3, wherein the rear elevation means comprise a pair of lateral pillars the upper parts of which are articulated about horizontal transverse axes to the upper platform and the lower parts of which are articulated to respective sliders slidable in longitudinal guides carried by the framework of the removable superstructure, each rear pillar being in turn articulated at a point intermediate its ends, about a transverse horizontal
- 80 axis to one end of a respective pivoting support, the two pivoting supports associated with the framework of the superstructure being keyed to a single common transverse shaft such that they lie parallel to each other and constitute a rigid fork, said shaft being rotatably supported by the rear cross member provided with support blocks, and actuator means being provided for effecting pivoting of the fork.

5. A vehicle according to Claim 4, wherein each longitudinal girder of the framework of the vehicle-carrying superstructure has, in correspondence with said fork, a substantially V-shaped recessed part the vertex of which is directed downwardly, the said actuator means comprising for each of the longitudinal girders of the framework, a jack which is
- 90 articulated at one end to the vertex of the recessed part of the corresponding girder, and is articulated at its other end to the corresponding pivoting support, the jacks being operable in unison to cause pivoting of the fork.

- 105 6. A road vehicle substantially as hereinbefore described with reference to the accompanying drawings.